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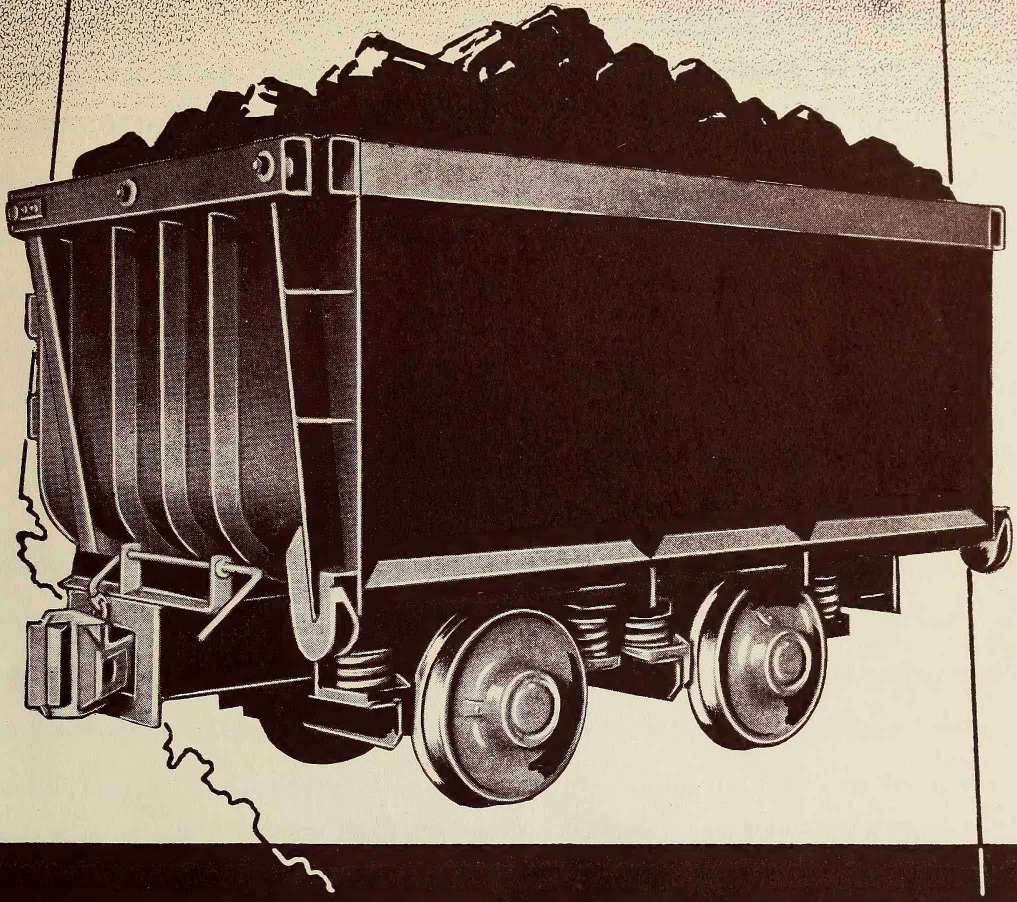
ALBERTA COALS



WHAT YOU SHOULD KNOW ABOUT THEM

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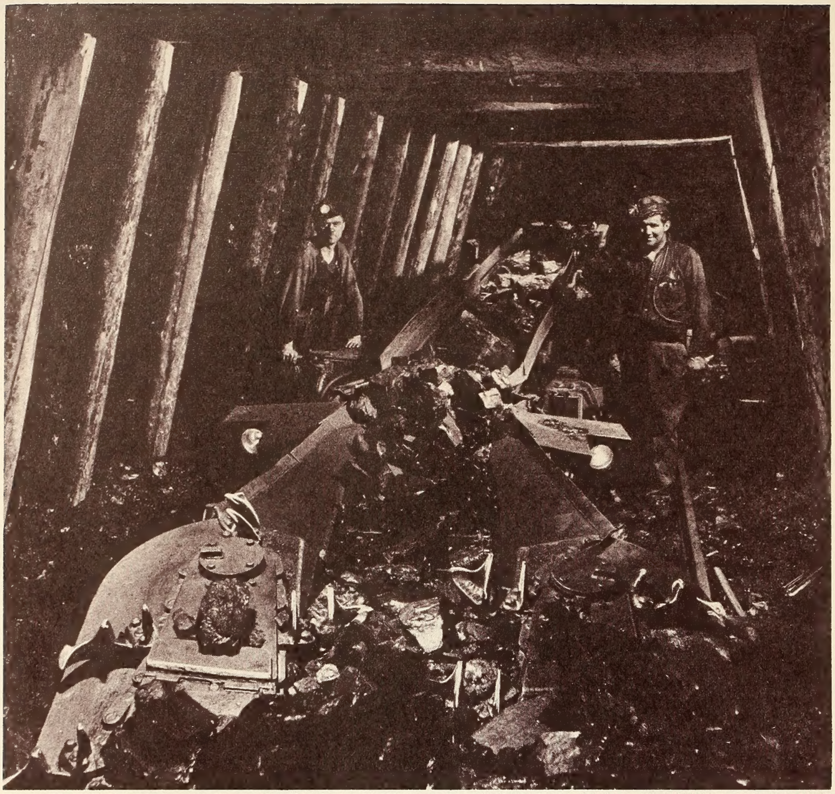
3LL ALBERTA COALS; WHAT YOU SHOULD KNOW ABOUT THEM.

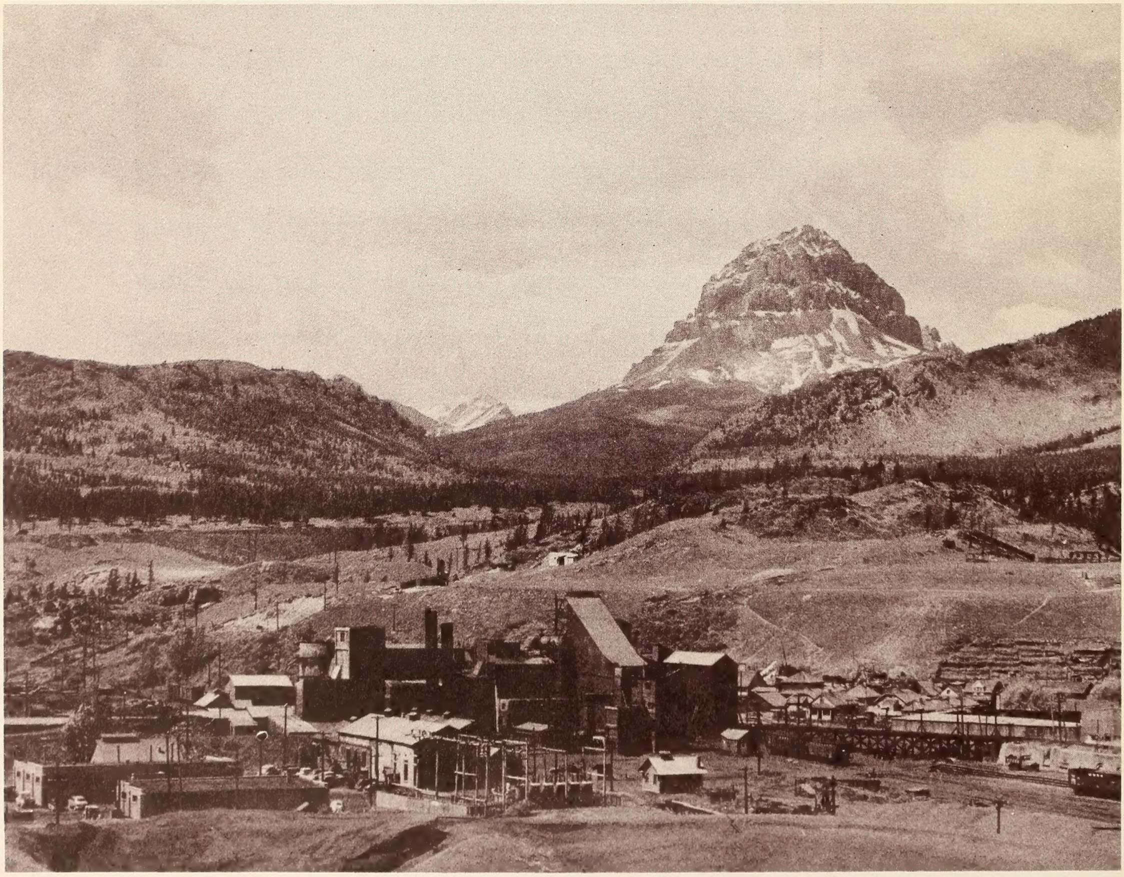
PREFACE

This booklet is designed to give you as dealers or consumers of coal and briquettes a brief outline of the occurrence and properties of Alberta coals. A simple "Group" classification for these coals, together with the physical, chemical, storage and burning properties of the coals in each group is included. Probably the most important section is that dealing with the essentials for the good firing of Alberta coals in domestic heating appliances. Careful consideration of this section is necessary because of the wide range of coals which are mined in Alberta. Finally there is a section dealing with the equivalent fuel costs of coal, oil, and natural gas, and a list of the principal Alberta coal producers with the trade name of their product. Further information with respect to any particular coal may be obtained from the coal operators, the Dominion Coal Board, the Mines Branch, Department of Mines and Technical Surveys, Ottawa, and the Research Council, University of Alberta, Edmonton.

The booklet was prepared by the Research Council of Alberta in collaboration with officials of the Dominion Coal Board, and the Fuels Division, Department of Mines and Technical Surveys, Ottawa. It was printed by the Department of Economic Affairs of Alberta from whom extra copies may be obtained. Further information, with respect to particular coals, may be secured from the company producing the coal, or from the Director of Mines, Department of Mines and Minerals of Alberta; the Research Council of Alberta, University of Alberta, Edmonton; and the Fuels Division, Department of Mines and Technical Surveys, Ottawa.



Machine loading of coal at an East Coulee mine in the Drumheller Valley



The International Coal mine of Coleman Collieries at Coleman, Alberta.

ALBERTA COALS
AND
WHAT YOU SHOULD KNOW ABOUT THEM

A wide variety of coals are produced in Alberta. Their physical and chemical properties and storage and combustion characteristics are related to the location at which they occur. For your convenience, the province has been divided into "coal areas" and the different kinds of coals have been classified into five general "Groups".

It is of importance for both dealers and consumers of Alberta coal to know not only that there are five "Groups" of coal but also the use or uses for which each "Group" is best suited. It is also important to know by what method the coal is mined and prepared as well as the best firing techniques that should be applied with each coal to secure maximum efficiency and convenience.

Since nearly 200 separate coal mines are operating in Alberta you should determine by trial and by advice from your coal dealer which "group" or "groups" of coals are best suited to your equipment and order coal by trade name, not just as "Alberta coal".

OCCURENCE AND PROPERTIES OF ALBERTA COALS WHICH ARE MINED AND MARKETED

Coal-bearing formations underlie most of the southern half of the Province of Alberta and coal is mined at a number of centres in the mountains, foothills and plains. The parts of the province in which coal has been or is being mined have been sub-divided into districts known as "Coal Areas" and are shown in the accompanying map, Figure I. In this map the Alberta "Group" classification is designated by hatching.

The coal seams in the mountains are often steeply pitching, see Figure II. The coal in these areas is generally friable which means that it breaks easily resulting in a high percentage of fines when mined. This is the result of the movement to which the coal material was subjected during the mountain building period.

The coal seams in the plains and outer foothills are flatlying and suffered little, if any, disturbance during the mountain-building period. As a result, the coal as mined is in large lumps with a relatively small amount of fines.

The coals of Alberta are young geologically - mainly Cretaceous with some Tertiary - but the upthrust of the Rocky Mountains played an important part in maturing them, especially those which occur in the foothills and mountain areas. The pressure exerted on the coals during the mountain-building period affected the rank and chemical properties to varying degrees. There is, therefore, a direct relationship between the location at which a coal occurs and its rank and chemical constitution.

The mountain coals vary from anthracitic to low and medium volatile bituminous in rank with a moisture content of 1 to 5 percent.

The foothills coals are high volatile, non-caking bituminous in rank with a moisture content of 5 to 10 percent.

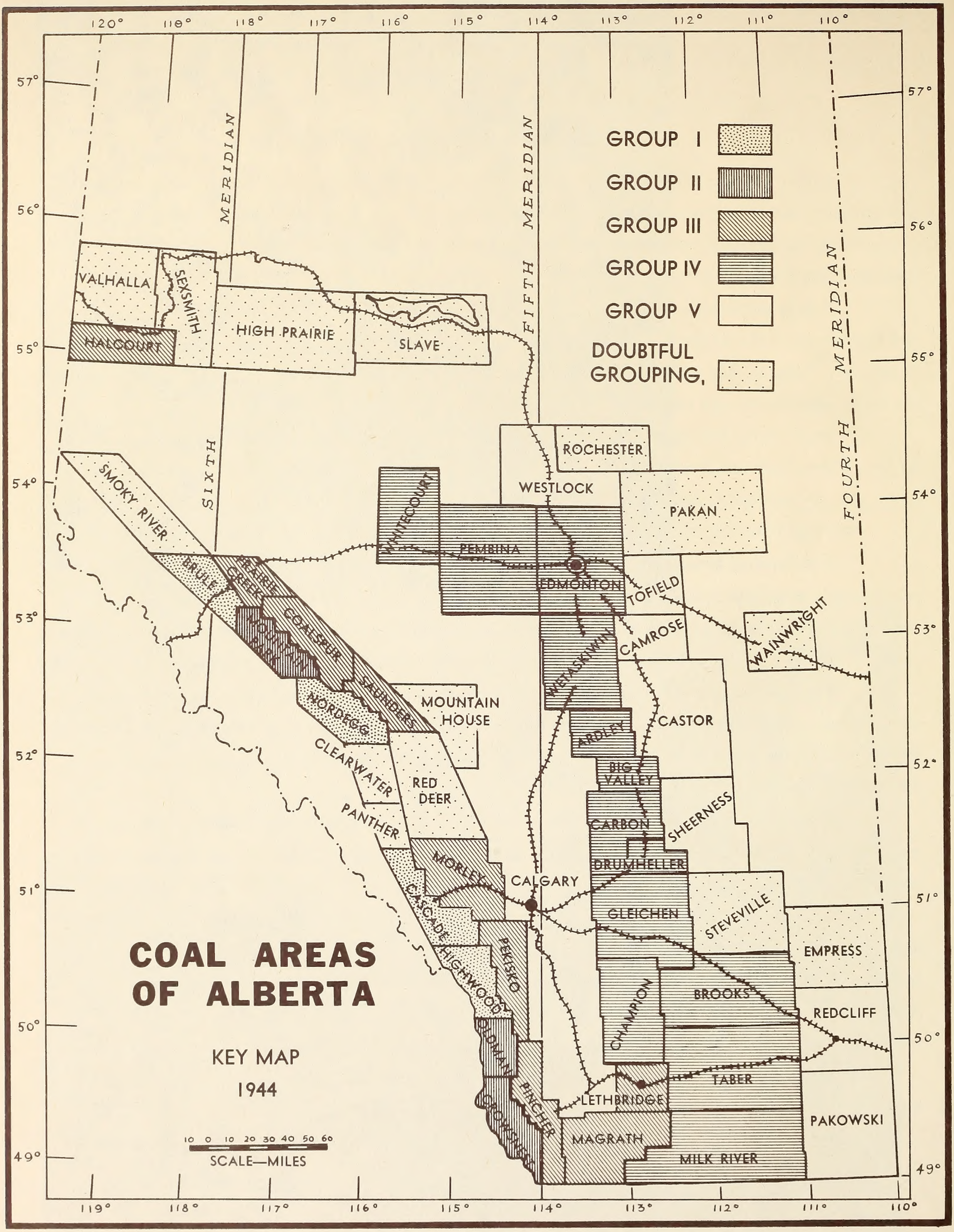

COAL AREAS OF ALBERTA
KEY MAP
1944
GROUP I
GROUP II
GROUP III
GROUP IV
GROUP V
DOUBTFUL GROUPING.
10 0 10 20 30 40 50 60
SCALE—MILES
SIXTH MERIDIAN
FIFTH MERIDIAN
FOURTH MERIDIAN
120°
119°
118°
117°
116°
115°
114°
113°
112°
111°
110°
57°
56°
55°
54°
53°
52°
51°
50°
49°
VALHALLA
SEXSMITH
HALCOURT
HIGH PRAIRIE
SLAVE
ROCHESTER
WESTLOCK
PAKAN
SMOKY RIVER
WHITECOURT
PEMBINA
EDMONTON
TOFIELD
WAINWRIGHT
BRULE
PRAIRIE CREEK
MOUNTAIN PARK
COALSPUR
CAMROSE
WETASKIWIN
SAUNDERS
NORDEGG
MOUNTAIN HOUSE
CASTOR
ARDLEY
BIG VALLEY
CLEARWATER
RED DEER
SHEERNESS
CARBON
PANTHER
DRUMHELLER
MORLEY
CALGARY
CASCADE
GLEICHEN
STEVEVILLE
EMPRESS
PEKISKO
HIGHWOOD
BROOKS
CHAMPION
REDCLIFF
OLDMAN
TABER
CROWSNEST
PINCHER
LETHBRIDGE
PAKOWSKI
MAGRATH
MILK RIVER

Figure I

The plains coals are mainly sub-bituminous in rank with some black lignite. The moisture content of these coals ranges from 10 to 30 percent.

"GROUP" CLASSIFICATION FOR ALBERTA COALS

In 1944, the Research Council of Alberta formulated the following simple, easy to remember, "Group" classification for Alberta coals which has been adopted by the Mines Branch of Alberta and by the Dominion Bureau of Statistics. By this method the coals are divided into five groups, the coals in each group having similar characteristics. However, it must be stressed that the actual chemical analysis of the coals in each group may show considerable variation from others in the same group but their general characteristics will be similar.

The Alberta "Group" classification is as follows:

Group I

Low volatile, non-caking bituminous coals from mountain areas.

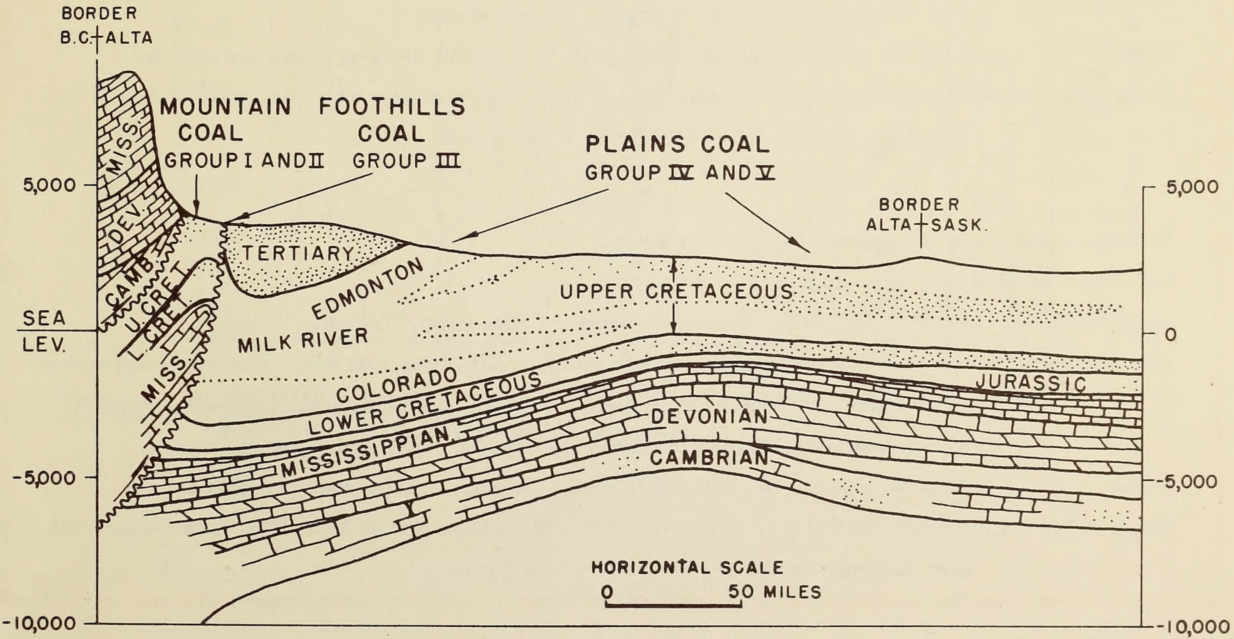
Canadian Classification: Low volatile bituminous, and some semi-anthracite.

Important Areas: Cascade, Nordegg. If the Highwood area is developed, it will be included in this group.

Characteristics: A good storage, weather resistant coal. Burns with a short slightly smoky flame. Used for domestic heating, railway fuel and for steam raising in general. Briquettes produced from the coal are used for domestic heating and locomotive fuel.

IDEAL GEOLOGICAL SECTION OF ALBERTA
ILLUSTRATING COAL BEARING FORMATIONS

Figure II



Output: Total for group 581,927 tons in 1952; one coal cleaning and two briquetting plants are operated.

Range of Typical Analyses: Moisture 1-2%, ash 8-10%, volatile matter 10-16%, fixed carbon 73-80%, heat value 14,000 to 14,200 B.t.u. per pound.

Group II

Medium and high volatile caking bituminous coals from mountain areas.

Canadian Classification: Medium volatile, and high volatile, A and B bituminous coal.

Important Areas: Crowsnest, Mountain Park, also Crowsnest, B.C. Area near the Alberta border.

Characteristics: A good storage, weather resistant coal. Burns with a medium to long, smoky flame. Used for domestic heating for locomotive fuel and steam raising in general. Also used for making coke, as smithy coal and in the cement industry.

Out put: Total for group 2,733,953 tons in 1952; Two briquetting, one coking and four cleaning plants are operated.

Range of Typical Analyses: Moisture 1 to 4.0%, ash 8 to 15%, volatile matter 20 to 36%, fixed carbon 46 to 65%, heat value 12,000 to 13,500 B.t.u. per pound.

Group III

Sub-bituminous coals, principally from the foothills areas.

Canadian Classification: Non-caking high volatile "C" bituminous.

Important Areas: Coalspur, Lethbridge, Prairie Creek, Saunders.

Characteristics: A good storage, weather resistant coal. It is a reactive non-caking coal that burns with a long, slightly smoky flame. Used for domestic heating and for steam raising purposes. It is a strong coal and can be shipped and stored well.

Output: Total for group 1,062,742 tons in 1952. Three coal cleaning plants are operated.

Range of Typical Analyses: Moisture 7 to 12%, ash 7 to 13%, volatile matter 32 to 35%, fixed carbon 41 to 50%, heat value 10,400 to 11,900 B.t.u. per pound.

Group IV

Domestic coals - fair storage coal from prairie areas.

Canadian Classification: Sub-bituminous A, B and C.

Important Areas: Brooks, Big Valley, Carbon, Drumheller, Edmonton, Pembina, Taber.

Characteristics: Can be stored under cover. It is a reactive non-caking coal that ignites easily and burns with a long smokeless flame. Used for domestic heating and also for steam raising in boilers with liberal furnace and grate dimensions. Usually shipped in box cars.

Output: Total for group 2,151,954 tons in 1952. One coal cleaning plant in operation.

Range of Typical Analyses: Moisture 16 to 25%, ash 6 to 12%, volatile matter 26 to 32%, fixed carbon 38 to 45%, heat value 8,500 to 10,000 B.t.u. per pound.

Group V

Domestic coals - fair storage under cover from prairie areas.

Canadian Classification: Sub-bituminous B and C

Important Areas: Camrose, Castor, Sheerness, Tofield.

Characteristics: Does not store as well as previous groups. It is a reactive, non-caking coal that ignites easily and burns with a long, smokeless flame. Used for domestic heating and for steam raising in boilers with liberal furnace and grate dimensions. It is shipped in box cars.

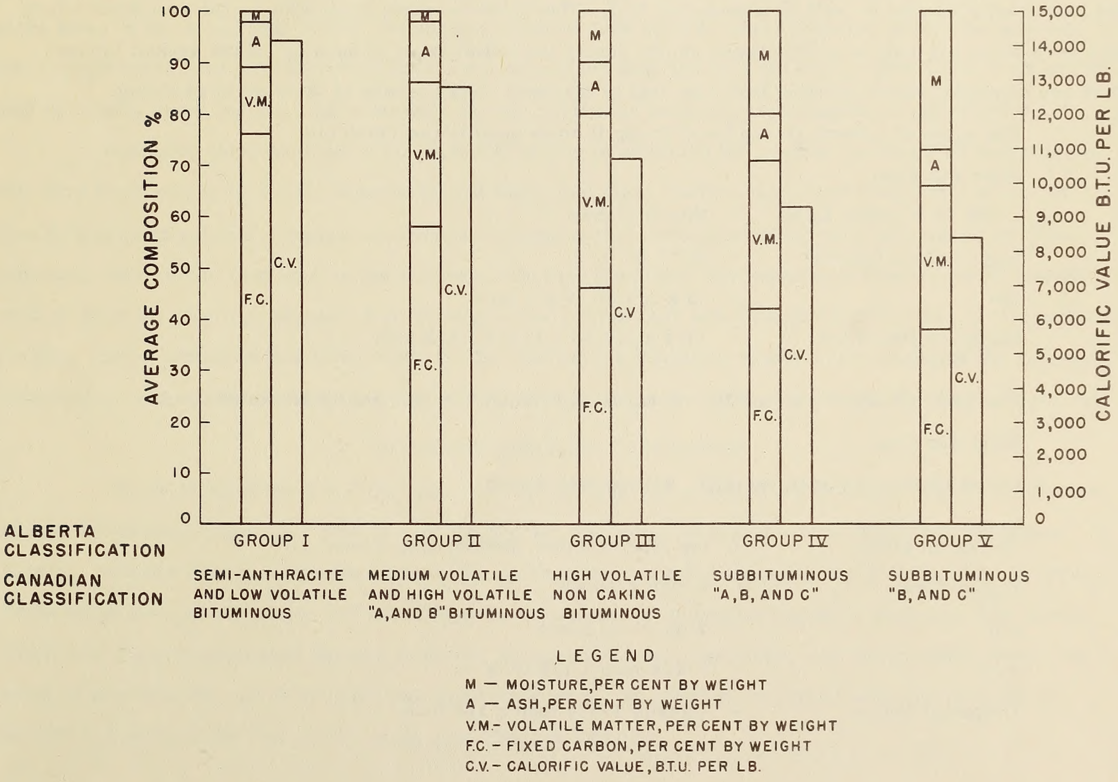
Output: Total for group 663,896 tons in 1952.

Range of Typical Analyses: Moisture 24 to 30%, ash 5 to 9%, volatile matter 27 to 30%, fixed carbon 35 to 40%, heat value 7,700 to 9,000 B.t.u. per pound.

Figure III illustrates comparative heat values of the five groups and shows an average chemical composition of each group.

DIAGRAMMATIC REPRESENTATION OF GROUP CLASSIFICATION OF ALBERTA COALS.

Figure III



METHODS OF MINING

Coal in Alberta is recovered by both underground and strip mining (Figure IV). Many of the underground mines are highly mechanized and have well designed tipples and preparation plants. Stripping operations have increased markedly in recent years, largely due to the lower cost of strip mining, where coal lies close to the surface. Strip coal is generally equal in heat value to coal deep mined in the same locality, but may have less eye appeal if recovered from seams having a thin porous covering.

PREPARATION AND SIZES OF COAL MARKETED

Coal as mined consists of an assortment of lumps, intermediate sizes and fines and is known as "Mine Run" coal. Usually, before it is marketed, it is passed through a tipple or preparation plant (Figure V) where the largest lumps may be crushed to a maximum of 4 to 6 inches and where the coal is screened into sizes suitable for the market.

The coal sometimes contains pieces of slate or rock from the roof or floor of the seam from which it is mined and this is removed by hand picking. It is also sometimes passed through a cleaning plant to remove finer mineral matter (ash) since a product with a low ash content is desirable. The coal may also be treated with oil or other reagent to allay dust during subsequent handling.

At certain mines, the coal fines (minus 1/4 inch) are mixed with 4 to 8 percent of asphalt and the mixture is pressed to form a sized fuel known as "briquettes". The briquettes can be used for railway and industrial purposes as well as a domestic fuel. They have the same heat value as the coal from which they were made but may be a little more smoky during the initial stage of burning off the asphalt binder. They are somewhat more reactive than raw coal of the same rank because of their uniform sizing.

The sizes of Alberta Group I and Group II coals usually marketed are:

Mine Run Coal

Lump or Furnace Lump - Plus 4 inches

Egg or Stove (cobble) - -4" x 2"

Nut - -2 x 3/4 or -2 x 1 inch

Stoker or Prepared Stoker - -3/4 x 1/4 or - 1-1/8 x 1/2 inch

The sizes of Alberta Group III, Group IV and Group V coals usually marketed are:

Mine Run Coal

Large Lump - top size variable, bottom size 4 inch

Lump or Double Screened Lump - top size variable, bottom size 4 inch

Egg or Stove - 4 inch x 2 inch

Nut - 2 inch x 3/4 inch

Pea - 1-1/4 inch x 1/4 inch

Prepared Stoker - Usually 1-1/4 inch x 1/2 inch

Combustion Characteristics in Relation to Analysis and Coal Size

In simple terms, coal is made up of four parts: moisture, ash, volatile matter, and fixed carbon. The volatile matter and fixed carbon are the only two constituents which burn to produce heat. Coal with low volatile matter and high fixed carbon burns with a short steady flame but as the volatile matter increases the more reactive and "flashy" becomes its burning characteristics. Surface moisture, inherent moisture and ash have no heat value and are responsible for heat losses. High inherent moisture, or high moisture within the coal, usually indicates a reactive smokeless fuel and is associated with high volatile matter. Ash can interfere with combustion by forming clinkers. The ash of Alberta Groups I and II coals usually fuses at high temperatures and is not a problem so far as clinkers are concerned. The ash of Alberta Groups III, IV and V coals may clinker but being weak and brittle it is easily broken causing no trouble. However, the higher the ash content of a coal the greater is the disposal problem.

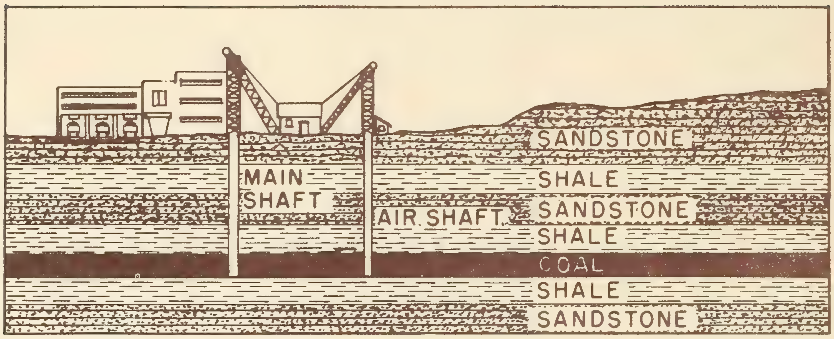
The prime objective of the householder is to obtain the optimum rate of burning. This is controlled by the resistance of the coal bed to the flow of air through it and also by the amount of available chimney draft which induces the flow of air. The resistance of the coal bed depends largely on the coal size. With the exception of mine run coal and slack (fines accumulated at screening plants), the coal sizes listed on page 10 are suitable for domestic heating appliances. The actual size required depends to a large extent upon the equipment in which it is to be burned. Large coal sizes give good results in large furnaces and small sizes in small furnaces and for banking fires for long periods. Most persons prefer lump, egg or stove sizes in furnaces; egg, stove, nut and pea sizes in cook stoves, space heaters, jacket heaters and other small appliances. Stoker coals have a variable size range but it is generally agreed that when stoker coal is closely sized and the size is suitable for the particular stoker it gives improved satisfaction.

Available chimney draft is an important factor in obtaining the desired burning rate and since it will vary from season to season remember that large coal sizes require less draft than small sizes. It should be pointed out that complete combustion of lump coal is usually attained with much more air than required, resulting in heat loss up the chimney. On the other hand, the chimney may not provide enough draft to draw the required amount of air through a bed of fine coal and it becomes difficult to obtain uniform burning. Some control is possible, however, by altering the thickness of ash on the grate but the domestic consumer should carefully choose the size of coal best suited to the combustion equipment he has installed.

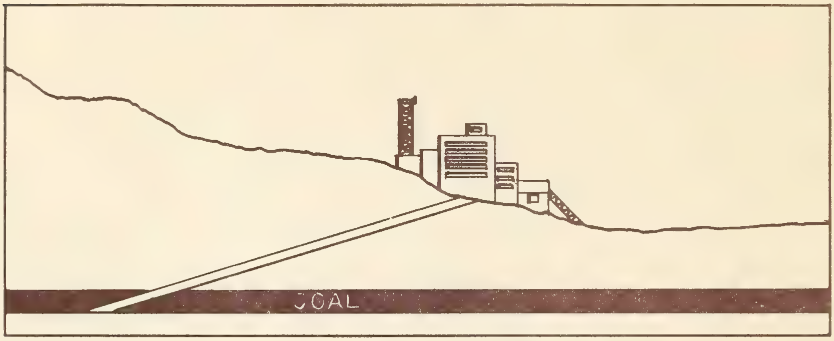
DOMESTIC HEATING EQUIPMENT

There is agreement that the factors of cleanliness and convenience are often adverse to the use of coal for domestic heating. This is undoubtedly the case when the equipment is antiquated or in poor repair. New and improved equipment is on the market and more is constantly being developed. In type, these range from small stoves and space heaters to completely automatic domestic stokers. The latter, fitted with electric automatic damper controls, barometric draft regulators, and thermostats, have done much to improve the convenience of coal-fired equipment. In addition, improvements can be made by careful selection of the fuel and by using good firing techniques.

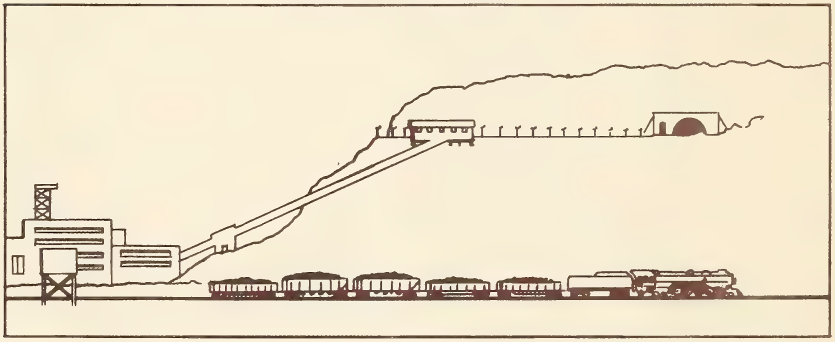
SHAFT MINE



SLOPE MINE



DRIFT MINE



STRIP MINE

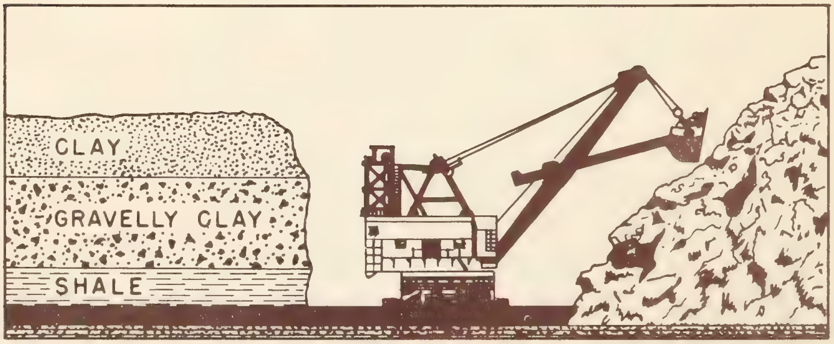


Figure IV

CARE AND MAINTENANCE OF HEATING EQUIPMENT

All heating equipment should be maintained in good repair, otherwise it may create both a health and a fire hazard. Your furnace should be checked at the beginning of each heating season to ensure that there will be no leak of the products of combustion into the warm air circulatory passages, that all dampers and doors are in good adjustment, that the flue pipe is sound, that the chimney is clean and free from cracks, loose mortar or obstructions, and that it has sufficient draft to remove to the atmosphere the products of combustion and provide for good draft to promote satisfactory burning of the coal. Consult your local furnaceman or coal dealer if your furnace smokes or if you detect the odor of flue gases in your home.

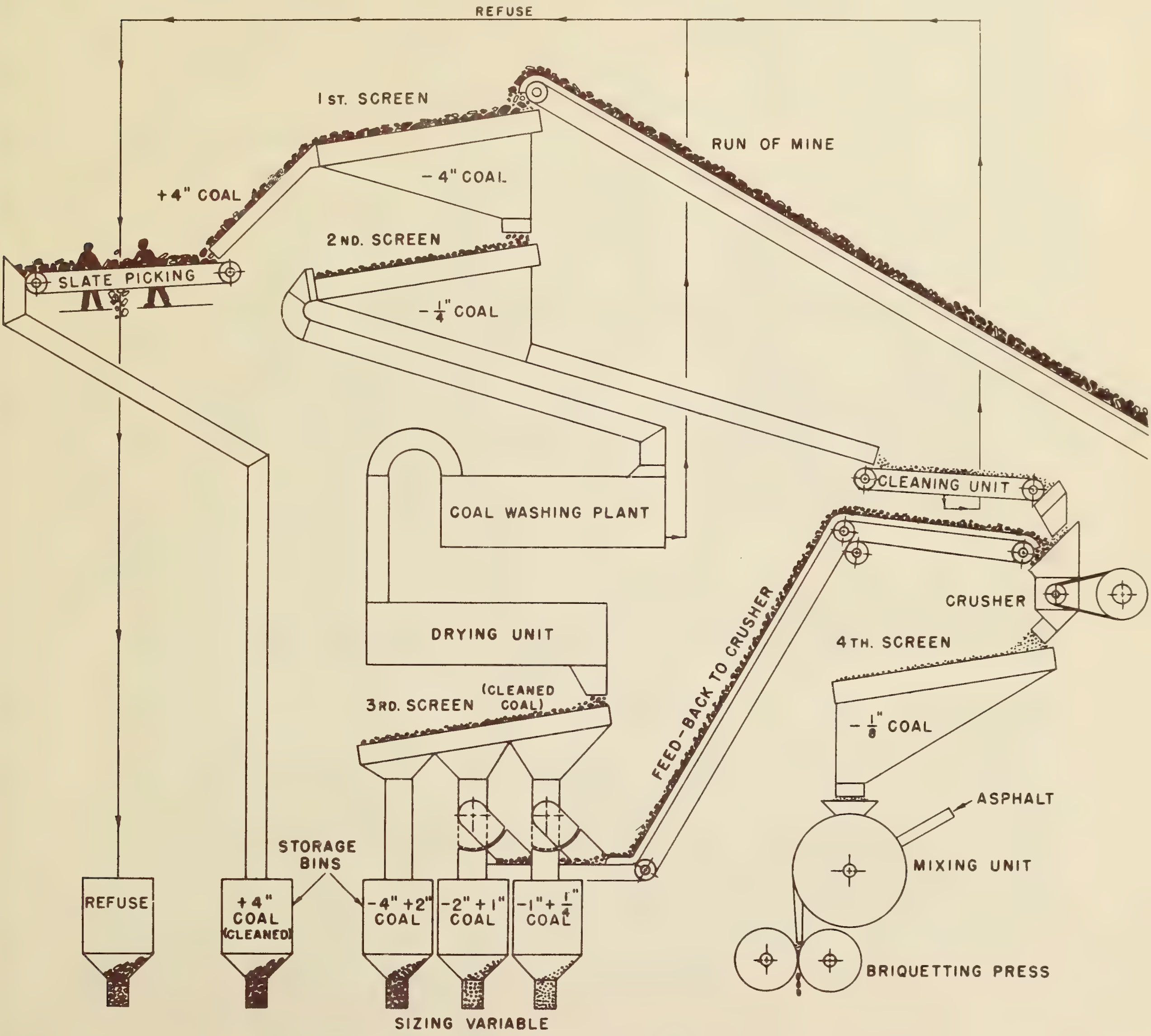


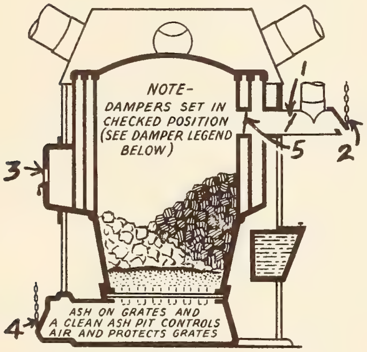
Figure V

ESSENTIALS FOR THE GOOD FIRING OF ALBERTA COALS AND BRIQUETTES

The non-caking types of Alberta coals are usually satisfactory for use in all domestic heating appliances. The action in the fire of coals from the various areas of Alberta will vary to a degree even though their chemical analyses are somewhat similar. One coal may require the ash pit sealed tight to control the burning while another may require it open to maintain the desired heat. Some Alberta coals may require more attention than others due to more rapid burning or a higher ash content. For this reason it is advised that the consumer know Alberta coals by TRADE NAME or GROUP in order that he may intelligently choose the coal best suited for his particular equipment and heating load.

The following instructions are intended as a guide, and may be modified slightly to suit particular circumstances.

1. Know your Equipment and Keep it Clean and in Good Condition:-



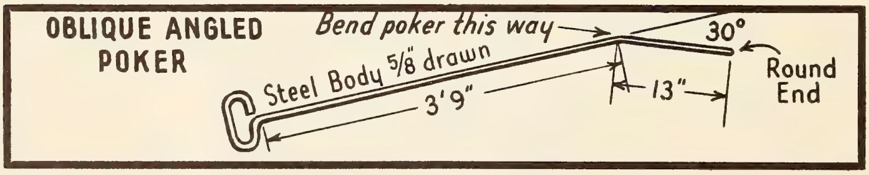
(1) Key damper. Must be located between check damper (2) and furnace. Do not close tightly at any time.

(2) Check damper. Principal control and operated in conjunction with ash pit damper.

(3) Fire door damper. Should be open at all times to assist in burning gases over the fuel bed.

(4) Ash pit damper. Open to increase fire with check damper (2) closed. Close to check fire with check damper (2) open.

(5) Direct damper (on some furnaces). Open when attending fire in order to keep any smoke from coming out fire door. Close at all other times.



2. Cautions: The following cautions should be observed.

They will not cause inconvenience but instead will become routine.

1. Don't let the fire roar.
2. Don't let the chimney pipes overheat.
3. Don't wet the coal.

4. Don't burn paper or garbage on a coal fire.
5. Never leave a heater unattended,
    (a) while dampers 4, 5 and 1 are open or
    (b) after firing fresh coal, until the gas is burning freely.
6. Always close check damper or open key damper if there is no check damper, before opening the fire door. This will prevent smoke from entering the room.
7. Always have a glowing spot of hot coals exposed on the fire bed.
8. Keep furnace heating surfaces clean. Remove soot deposits regularly from smoke pipes, chimney, etc.

3. Choose the Correct Coal Size:

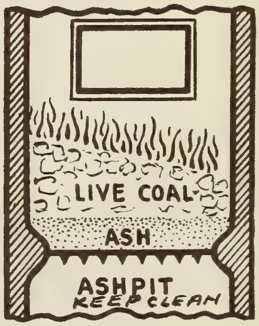
Your coal dealer can be of much assistance in choosing the correct coal size for your furnace. No two furnaces or heating loads are identical so experiment intelligently. Remember large sizes require the least amount of draft; smaller sizes require more draft.

4. Starting a Fire with Alberta Coal or Briquettes:

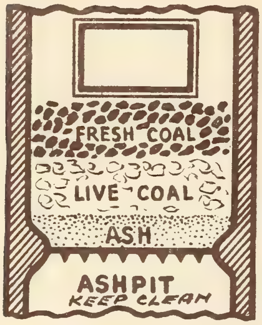
Leave two or three inches of ash on the grate. Make a wood fire on the ash and then charge a thin layer of coal or briquettes. Be certain that the fire door damper, key damper and ash pit damper are open and the check damper closed. When the coal is burning freely add another thin layer of coal or briquettes. Continue until the desired depth of fire is obtained. Another method of starting a fire with Alberta bituminous coal is to make a wood fire on top of a bed of coal. The coal will ignite more slowly and will produce the least amount of smoke.

5. Cleaning the Fire:

Let the fire burn down as shown. For Group I coals shake grates gently to work fine ash through the grates; do not use a poker to clean the fire. For groups II, III, IV and V coals use the oblique-angled poker very gently to break up any friable clinker and work fine ash through the grate leaving the heavy ash as a base for the fresh coal. In any case do not disturb the fire unnecessarily and take care to prevent smoke during and after cleaning.



6. Refueling Alberta Group I coals:



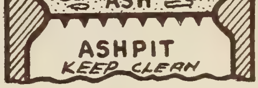
The Spreading Method is applicable to low volatile fuels such as Alberta Group I semi-anthracite coals. This method should never be used for firing bituminous coal in domestic appliances, because with bituminous coal it produces heavy black smoke and also unburned gases which are mildly explosive and liable to cause a "puff-back".

The Red Deer Valley Coal Co. mine at Nacmine in the Drumheller Valley.

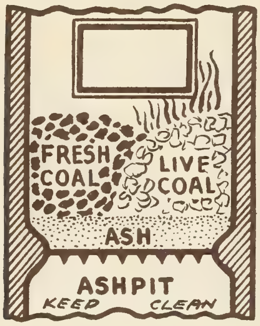
Mining on a pitch at Coleman Collieries' mine in the Crowsnest Pass.

7. Preparing to Refuel Briquettes and Alberta Groups II, III, IV and V Coals:

Move all red coals to one side so that one-half of the grate is covered with dead ash only. Be careful not to mix ashes with live coal. If necessary break up clinkers and work fine ash through grate area which is to receive fresh coal. Repeat on alternate sides at each refuel.

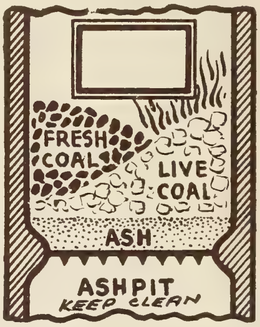


8. Refueling Briquettes and Alberta Groups II, III, IV and V Coals:

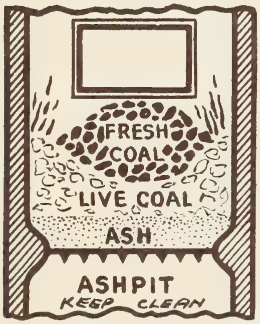


The Improved Side-Bank method is applicable to high volatile fuels, briquettes and Alberta groups II, III, IV and V coals. This method is recommended in all cases where the firebox size, combustion space and shape permit a distinct division of the grate area into two horizontal strips extending from the charging door side to the rear end of the grates and where the heat demand is not subject to quick, wide variations.

The Ordinary Side-Bank method, also known as the "front and rear" or "alternate firing" method, is applicable to medium and high volatile fuels, briquettes and Alberta groups II, III, IV and V coals. This method or some modification of it must be used if satisfactory results are to be obtained from these fuels in small domestic appliances.



9. A Special Refueling Method for Alberta Briquettes:



The Conical or Cone method is applicable to medium volatile fuels such as Alberta briquettes. This is a special method suitable only in large furnaces and must be used with care.

10. Banking a Fire:

Follow the usual applicable method of refueling explained above. Shut ash pit damper tight, close chimney dampers as far as possible without forcing gases out into the room. Control the rate of burning by the amount of check damper opening. Do not spread ashes on top of coal to reduce the rate of burning but instead spread a layer of fine coal over the top of the latest coal charge.

Power loading in the Bellevue mine of West Canadian Collieries.

Briquettes from Canmore Mines Limited, Canmore, Alberta, move down a conveyor.

EQUIVALENT FUEL COSTS OF COAL VS. OIL AND GAS

The cost of fuel is a major consideration for most consumers. Very often a dealer or consumer wishes to compare, on a cost basis, the value of one coal with another also the price of oil or gas which he can afford to pay based on the local cost of coal. Table I* shows on any horizontal line the equivalent costs of coals of various heat values and also the equivalent cost for oil and gas for the same house and heating equipment. Relative average efficiencies have been included in the assembling of the figures.

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* Adopted from "Heating the Farm Home", a booklet prepared under the auspices of the Prairie Rural Housing Committee sponsored by the Governments of the Provinces of Manitoba, Saskatchewan and Alberta and by Central Mortgage and Housing Corporation.

Examples of the Use of Table I

Example 1. - Suppose that a Group I coal is the fuel being used with hand firing. Also suppose its cost is $15.90 per ton with a heat value of 14,000 B.t.u. per pound. How much should the consumer pay for Group IV coal with a heat value of 9,500 B.t.u. per pound to have the same overall cost?

In Group II and I of Anthracite, Briquettes and Coke hand fired without controls, under column headed 14,000, come down to $15.90. On the same horizontal line to the left in Group IV of Lignite, Sub-bituminous and Bituminous Coal Hand Fired Without Controls, under column 9,500 is found $9.15. For equivalent cost, the Group IV coal should then be purchased for $9.15 per ton. If the local price is $8.50 per ton a saving is realized in the ratio of $9.15 to $8.50 or 7%.

Example II. - Suppose Group III coal costing $11.05 per ton, with a heat value of 11,500 B.t.u. per pound, is the fuel being used with hand firing. A conversion to oil is considered in the same furnace with oil costing 14 cents per gallon. Which fuel is favoured on a cost basis?

In Group III of Lignite, Sub-bituminous and Bituminous Coal Hand Fired Without Controls under column headed 11,500 come down to $11.05. On the same horizontal line to the left under heading "Heating System Converted to Oil" is found 10.3. The justified cost of oil in comparison to the coal is therefore 10.3 cents per gallon, but it actually costs 14 cents per gallon. To convert to oil will increase heating costs in the ratio of 14 to 10.3 or by 36%. Coal in this case is favoured on a cost basis.

Table I

GAS	OIL	OIL	LIGNITE, SUB-BITUMINOUS AND BITUMINOUS COAL (Hand fired without automatic controls)											LIGNITE AND BITUMINOUS COAL (Hand fired with controls or stoker fired) ANTHRACITE BRIQUETTES AND COKE (Hand fired without controls)										
100000 btu PER THERM	168,000 btu PER GALLON		GROUP V				GROUP IV			GROUP III		GR. II		GROUP V				GROUP IV		GROUP III			GROUP II & I	
			7000	8000	8500	9000	9500	10000	10500	11000	11500	12000	12500	7000	8000	8500	9000	9500	10000	10500	11000	12000	13000	14000
COST IN CENTS PER THERM	HEATING SYSTEM DESIGNED FOR OIL	HEATING SYSTEM CONVERTED TO OIL		Camrose, Castor Redcliff Sheerness Tofield				Brooks, Carbon Drumheller Edmonton Pembina, Taber			Coalspur Lethbridge Prairie Crt. Saunders		Crowsnest Mountain Park		Camrose, Castor Redcliff Sheerness Tofield			Brooks, Carbon Drumheller Edmonton Pembina, Taber			Coalspur Lethbridge Prairie Crt. Saunders		Cascade Nordegg Crowsnest Mountain Park	
	COST IN CENTS PER GALLON		COST IN DOLLARS PER TON											COST IN DOLLARS PER TON										
3.0	5.0	4.4	2.90	3.30	3.50	3.70	3.90	4.10	4.35	4.55	4.75	4.95	5.15	3.40	3.90	4.10	4.35	4.60	4.85	5.10	5.35	5.85	6.35	6.80
3.4	5.7	5.0	3.30	3.70	3.95	4.20	4.40	4.65	4.90	5.15	5.35	5.60	5.85	3.85	4.40	4.70	4.95	5.20	5.50	5.80	6.10	6.65	7.15	7.75
3.8	6.4	5.6	3.65	4.15	4.45	4.70	4.95	5.20	5.50	5.75	6.00	6.25	6.55	4.30	4.90	5.20	5.55	5.85	6.15	6.50	6.80	7.40	8.00	8.65
4.2	7.1	6.2	4.05	4.60	4.90	5.20	5.45	5.75	6.05	6.35	6.65	6.95	7.20	4.80	5.45	5.80	6.10	6.45	6.80	7.15	7.50	8.20	8.85	9.55
4.6	7.7	6.8	4.45	5.05	5.35	5.65	6.00	6.30	6.65	6.95	7.25	7.60	7.90	5.25	5.95	6.35	6.70	7.10	7.45	7.85	8.20	8.95	9.70	10.20
5.0	8.4	7.4	4.85	5.50	5.85	6.20	6.50	6.85	7.20	7.55	7.90	8.25	8.60	5.70	6.50	6.90	7.30	7.70	8.10	8.55	8.95	9.75	10.55	11.35
5.4	9.1	7.9	5.20	5.95	6.30	6.70	7.05	7.45	7.80	8.15	8.55	8.90	9.30	6.15	7.00	7.45	7.90	8.30	8.75	9.20	9.65	10.55	11.40	12.30
5.8	9.8	8.5	5.60	6.40	6.80	7.20	7.60	8.00	8.40	8.75	9.15	9.55	9.95	6.60	7.55	8.00	8.45	8.95	9.40	9.90	10.35	11.30	12.25	13.20
6.2	10.4	9.1	6.00	6.85	7.25	7.70	8.10	8.55	8.95	9.40	9.80	10.25	10.65	7.05	8.05	8.55	9.05	9.55	10.05	10.60	11.10	12.10	13.10	14.10
6.6	11.1	9.7	6.40	7.25	7.70	8.15	8.60	9.10	9.55	10.00	10.45	10.90	11.35	7.50	8.55	9.10	9.65	10.20	10.70	11.25	11.80	12.85	13.90	15.00
7.0	11.8	10.3	6.75	7.70	8.20	8.65	9.15	9.65	10.10	10.60	11.05	11.55	12.05	7.95	9.10	9.65	10.25	10.80	11.40	11.95	12.50	13.65	14.75	15.90
7.4	12.4	10.9	7.15	8.15	8.65	9.15	9.65	10.15	10.70	11.20	11.70	12.20	12.70	8.40	9.65	10.20	10.80	11.40	12.05	12.60	13.25	14.45	15.60	16.80
7.8	13.1	11.5	7.55	8.55	9.10	9.65	10.20	10.70	11.25	11.80	12.35	12.85	13.40	8.85	10.15	10.80	11.40	12.05	12.70	13.30	13.95	15.20	16.45	17.70
8.2	13.8	12.1	7.90	9.00	9.55	10.15	10.70	11.30	11.85	12.40	12.95	13.55	14.10	9.30	10.65	11.35	12.00	12.65	13.30	14.00	14.65	16.00	17.30	18.60
8.6	14.5	12.6	8.30	9.45	10.05	10.65	11.20	11.80	12.40	13.00	13.60	14.20	14.75	9.80	11.20	11.90	12.60	13.30	14.00	14.70	15.40	16.80	18.15	19.55
9.0	15.1	13.2	8.70	9.90	10.50	11.10	11.75	12.35	13.00	13.60	14.20	14.80	15.45	10.25	11.75	12.45	13.20	13.90	14.65	15.40	16.10	17.60	19.00	20.45
9.4	15.8	13.8	9.10	10.30	10.95	11.60	12.25	12.90	13.50	14.20	14.80	15.50	16.10	10.70	12.20	13.00	13.75	14.50	15.30	16.05	16.80	18.35	19.80	21.35
9.8	16.5	14.4	9.45	10.75	11.40	12.10	12.80	13.45	14.10	14.80	15.45	16.15	16.80	11.15	12.75	13.55	14.35	15.10	15.95	16.70	17.50	19.10	20.65	22.25
10.2	17.1	15.0	9.85	11.20	11.90	12.60	13.30	14.00	14.70	15.40	16.10	16.80	17.50	11.60	13.30	14.10	14.95	15.75	16.60	17.40	18.25	19.90	21.55	23.20
10.6	17.8	15.6	10.25	11.65	12.35	13.10	13.80	14.55	15.30	16.00	16.70	17.45	18.20	12.05	13.75	14.65	15.50	16.35	17.20	18.05	18.90	20.65	22.40	24.10
11.0	18.5	16.2	10.60	12.10	12.85	13.60	14.35	15.10	15.85	16.60	17.35	18.10	18.85	12.50	14.30	15.20	16.05	16.90	17.80	18.80	19.65	21.40	23.20	25.00
11.4	19.2	16.8	11.00	12.50	13.30	14.10	14.90	15.65	16.45	17.20	18.00	18.80	19.55	12.95	14.80	15.70	16.65	17.50	18.45	19.45	20.35	22.20	24.05	25.90
11.8	19.8	17.4	11.40	12.95	13.80	14.60	15.40	16.20	17.00	17.80	18.60	19.45	20.20	13.40	15.30	16.30	17.20	18.50	19.10	20.15	21.05	22.95	24.90	26.80
12.2	20.5	17.9	11.80	13.40	14.25	15.10	15.90	16.75	17.60	18.45	19.25	20.10	20.90	13.90	15.80	16.80	17.80	18.75	19.75	20.80	21.80	23.70	25.75	27.70
12.6	21.2	18.5	12.20	13.85	14.70	15.60	16.45	17.30	18.20	19.00	19.85	20.75	21.60	14.30	16.35	17.40	18.40	19.40	20.40	21.50	22.50	24.50	26.60	28.60
13.0	21.8	19.1	12.55	14.30	15.20	16.05	16.95	17.85	18.75	19.60	20.50	21.40	22.25	14.80	16.85	17.95	19.00	20.00	21.00	22.20	23.20	25.30	27.40	29.55
13.4	22.5	19.7	12.95	14.70	15.65	16.55	17.50	18.45	19.35	20.20	21.15	22.05	22.95	15.25	17.40	18.50	19.55	20.60	21.70	22.85	23.90	26.10	28.25	30.40
13.8	23.2	20.3	13.30	15.15	16.10	17.05	18.00	19.00	19.90	20.85	21.80	22.70	23.65	15.70	17.90	19.00	20.15	21.20	22.30	23.55	24.60	26.85	29.10	31.35
14.2	23.9	20.9	13.70	15.60	16.55	17.55	18.55	19.50	20.50	21.45	22.40	23.40	24.35	16.15	18.40	19.60	20.70	21.80	23.00	24.20	25.35	27.60	30.00	32.25
14.6	24.5	21.5	14.10	16.05	17.05	18.05	19.05	20.05	21.10	22.05	23.00	24.00	25.00	16.60	18.95	20.15	21.30	22.45	23.65	24.90	26.05	28.40	30.80	33.20
15.0	25.2	22.0	14.50	16.50	17.50	18.55	19.60	20.60	21.65	22.65	23.70	24.70	25.70	17.05	19.45	20.70	21.90	23.05	24.30	25.60	26.80	29.20	31.65	34.10
15.4	25.9	22.6	14.90	16.90	18.00	19.05	20.10	21.20	22.20	23.25	24.30	25.35	26.40	17.50	20.00	21.15	22.45	23.70	24.90	26.30	27.50	30.00	32.50	35.00
15.8	26.6	23.2	15.25	17.35	18.45	19.55	20.65	21.75	22.80	23.85	24.90	26.00	27.10	18.00	20.50	21.80	23.05	24.30	25.60	27.00	28.20	30.75	33.35	35.90
16.2	27.2	23.8	15.65	17.80	18.90	20.00	21.15	22.25	23.40	24.45	25.60	26.65	27.80	18.40	21.00	22.35	23.65	24.90	26.20	27.65	28.95	31.50	34.20	36.80
16.6	27.9	24.4	16.00	18.25	19.40	20.55	21.70	22.80	23.95	25.10	26.20	27.35	28.45	18.90	21.55	22.90	24.20	25.50	26.85	28.35	29.60	32.30	35.00	37.75
17.0	28.6	25.0	16.40	18.70	19.85	21.00	22.20	23.40	24.55	25.70	26.85	28.00	29.15	19.30	22.05	23.45	24.80	26.15	27.50	29.00	30.40	33.10	35.90	38.60
17.4	29.2	25.6	16.80	19.10	20.30	21.50	22.70	23.90	25.15	26.30	27.45	28.65	29.80	19.80	22.60	24.00	25.40	26.75	28.20	29.70	31.05	33.85	36.70	39.50
17.8	29.9	26.2	17.20	19.55	20.80	22.00	23.20	24.45	25.70	26.80	28.10	29.30	30.50	20.20	23.10	24.55	26.00	27.40	28.80	30.40	31.80	34.60	37.60	40.50
18.2	30.6	26.8	17.60	20.00	21.25	22.50	23.75	25.00	26.25	27.50	28.70	30.00	31.20	20.70	23.60	25.10	26.60	28.00	29.45	31.05	32.50	35.40	38.40	41.40
18.6	31.2	27.4	18.00	20.45	21.70	23.00	24.30	25.60	26.85	28.10	29.35	30.65	31.90	21.15	24.15	25.65	27.15	28.60	30.10	31.75	33.20	36.20	39.25	42.30
19.0	31.9	28.0	18.35	20.90	22.20	23.50	24.80	26.10	27.40	28.70	30.00	31.30	32.55	21.60	24.65	26.20	27.70	29.20	31.75	32.40	33.90	37.00	40.10	43.20

A dragline loads trucks high on the Grassy Lake strip mine of West Canadian Collieries in the Crowsnest Pass.

Operating Coal Mines and Trade Names of Products

The following mines each produced more than 10,000 tons of coal during 1952. The mines are listed by Groups and included in the tabulation are areas, numbers and names of mines, P.O. address of mines, and registered trade names of the products. A complete list of operating mines is contained in the Annual Reports of the Mines Division of the Department of Mines and Minerals of the Province of Alberta, and in "Coal Mines in Canada", Department of Mines and Technical Surveys, Ottawa.

COAL AREA	MINE NO.	NAME	ADDRESS	REGISTERED TRADE NAME
		GROUP I		
Cascade	2	The Canmore Mines Ltd.	Canmore	Canmore Smokeless Coal Canmore Briquettes
Nordegg	256) 1585)	Brazeau Collieries Ltd.	Nordegg	Brazeau Bituminous Steam Coal Brazeau Briquettes
		GROUP II		
Mountain Park	** 905	Luscar Coals Ltd.	Luscar	Luscar Coals Tiger Briquettes
Crowsnest	**1584) ** 396) 87)	West Canadian Collieries Ltd.	Blairmore	Adanac Coal Greenhill Coal Bellevue Coal Monitor Briquettes
	204) ** 88) * 1695	Coleman Collieries Ltd.	Coleman	McGillivray Creek Coal International Coal International Coke Hillcrest-Mohawk Coal
		GROUP III		
Lethbridge	1581	J. J. Hamilton Coal Co.	Lethbridge	Federal Coal
Lethbridge	1263) 1464)	Lethbridge Collieries Ltd.	Lethbridge	Cadillac Coal Galt Coal
Saunders	852	Alexo Coal Co. Ltd.	Alexo	Alexo and Acorn Saunders Coal
Coalspur	* 1157	Bryan Mountain Coal Co., Ltd.	Robb	Bryan Mountain Hard Coal
	* 1002	Sterling-Coal Valley Mining Co.	Coal Valley	Cova Coal
	771	Foothills Collieries Ltd.	Foothills	Foothills Coal
	846	McLeod River Hard Coal Co. Ltd.	Mercoal	McLeod River Hard Coal
		GROUP IV		
Pembina	* 419	Alberta Southern Coal Co. Ltd.	Wabamun	Victory Coal
	* 1645	Lothian Collieries Ltd.	Wabamun	Blue Flame Coal
	* 1644	Strawberry Creek Coal Co.	Warburg	Strawberry Creek Coal
Edmonton	1266	Edmonton Collieries Ltd.	Namao	New Black Gem Coal
	1316	Samis Collieries Ltd.	Namao	Samis Coal
	1463	Riverdale Coals Limited	Namao	Dependable Coal
	1635	Morinville Collieries Ltd.	Morinville	Spitfire Coal
	* 1696	Mearn's Coal Co. Ltd.	Morinville	Mearn's Coal
	* 129	Sundance Mines Ltd.	Cardiff	Suncole
	* 1582	Egg Lake Coal Co.	Morinville	Egg Lake Coal
	1626	J. B. Starky Co. Ltd.	R. R. 2, St. Albert	Star-Key Coal

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COAL AREA	MINE NO.	NAME	ADDRESS	REGISTERED TRADE NAME
		Group IV (cont'd)		
Edmonton	* 1724	Banner Coals Ltd.	Edmonton	New Penn
Ardley	* 809	Allyn Mann Construction Co.	Alix	Eclipse Coal
Big Valley	864	Big Valley Collieries Ltd.	Big Valley	Big Valley Coal
Brooks	* 1404	Kleenbirn Collieries Ltd.	Eyremore	Birnwell
Brooks	1672	Coral Coals Ltd.	Rolling Hills	Rolling Hills
Carbon	1060	East Carbon Coal Co. Ltd.	Carbon	Reliable Coal
Carbon	* 194	A. A. McArthur	Carbon	Knee Hill Coals
Drumheller	1421)	Saskatchewan Federated Co-ops Ltd.	Drumheller	Hy-Grade Coal
	436	Star Coal Co. Ltd.	Aerial	Star Coal
	1669	Joy Coal Mining Co. Ltd.	Cambria	Sunshine Coal
	1511	Aetna Coals Ltd.	Cambria	Aetna Coal
	1520	The Minute Coal Co.	Drumheller	Good Quality Coal
	1570	Wayne Coal Co.	Cambria	Sovereign Coal
	367	Midland Coal Mining Co. Ltd.	Drumheller	Midland Coal Mercury Coal
	1258	Brilliant Coal Co. Ltd.	Drumheller	Brilliant Coal
	1573	Monarch Coal Mining Co. Ltd.	East Coulee	Western Monarch Coal
	402	Red Deer Valley Coal Co., Ltd.	Nacmine	Glocoal Coal
	422) 1484)	Century Coals Ltd.	Drumheller East Coulee	Commander Coal New Wildfire Coal
	1491	Murray Collieries Ltd.	East Coulee	New Murray Coal
Taber	* 1604	Alberta Southern Coal Co.	Taber	Southalta Coal
		GROUP V		
Tofield	* 215	Dodds Coal Mine	Dodds	North Star Coal
	* 252	Tofield Coal Co., Ltd.	Tofield	Headlight Coal
	* 1107	Black Nugget Coal Co., Ltd.	Dodds	Hi-lo Coal
Camrose	* 1603	Camrose Collieries Ltd.	Camrose	Camrose Coal
Castor	* 1046	Battle River Coal Co. Ltd.	Halkirk	(Trade Name Pending)
	* 1614	Stettler Coal Co. Ltd.	Stettler	All-Fire Coal
	* 1578	Forestburg Collieries Ltd.	Forestburg	Diplomat Coal
Sheerness	* 1597	Crystal Coal Co.	Hanna	Crystal Coal
	* 443	Western Dominion Coal Mines	Sheerness	Roselyn

Underground Mine   * Strip Mine   ** Strip and Underground Mine

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